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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/618,317	07/11/2003	Guolin Ma	10020800-1	4776

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AVAGO TECHNOLOGIES, LTD.
P.O. BOX 1920
DENVER, CO 80201-1920

EXAMINER	
HOLTON, STEVEN E	
ART UNIT	PAPER NUMBER
2629	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/21/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/618,317	MA ET AL.	
	Examiner	Art Unit	
	Steven E. Holton	2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 November 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-8,12 and 13* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-8,12 and 13* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This Office Action is made in response to applicant's amendment filed on 11/22/2006. Claims 1, 3-8, 12, and 13, are currently pending in the application. An action follows below:

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

2. Claims 1 and 3-5 are rejected under 35 U.S.C. 102(a) as being anticipated by Sayers (USPN: 6527411).

Regarding claim 1, Sayers teaches an optical conduit comprising, "a body formed from optically transmissive material (Figs. 3-6, elements 30 and 32) having: an input end for light input (Fig. 5, element 10), an output end for light output (Fig. 5, element 12); and a curved surface that totally and internally reflects light from the input end towards the output end (Fig. 5, elements 34 and 36); a light source embedded at the input end of the body, such that light is channeled from the input end through the body and emitted out the output end (Figs. 5 and7, element 18); and a reflector cup embedded at the input end of the body and surrounding the light source (Fig. 11, element 70), the reflector cup configured to redirect light from the light source towards the output end of the body (col. 4, lines 26-28)".

Regarding claims 3 and 4, Sayers teaches the shape of the light pipe being a parabola and using different transitional parabolas (using different formulas) within the light pipe shape (col. 3, lines 43-63).

Regarding claim 5, Sayers discloses the light source is a light-emitting diode (col. 2, lines 49-51).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sayers.

Regarding claim 6, Sayers teaches the optical pipe being straight and lacking an overall bend or curved shape. However, it would be a matter of design choice for one skilled in the art to form an optical light pipe into a shape with an internal angle or bend or a straight body depending on the desired application of the light pipe. As shown in other references light pipes with angles and bends can be made by one skilled in the art and therefore, a bending or angled light pipe would be a matter of design choice for one skilled in the art.

Regarding claim 7, Sayers teaches forming the optical pipe out of an epoxy resin (polycarbonate epoxy resins are known in the art), polyurethane (an acrylic), glass or

other optically clear substances. The Examiner notes that acrylic, polycarbonate, and optical grade plastic are also well known in the art as suitable materials for forming optical waveguides and would be an obvious design choice for one skilled in the art when selecting materials for forming an optical waveguide.

4. Claims 8,12, and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Son (USPN: 6741234) in view of Sayers.

Regarding claims 8 and 13, Son discloses an optical mouse with a housing (Fig. 7, element 26), an image sensor (Fig. 7, element 27) for capturing images of a surface (Fig. 7, element 28), an optical conduit made from optically transmissive material, channeling light form the light source onto the surface (Fig. 8, element "light emitting lense") with an input and output and a lens to focus the light reflecting off the surface onto the image sensor (Fig. 7, element 25). However, Son does not expressly disclose the optical conduit having a curved interior surface, a light source embedded within the optical conduit or a reflector cup embedded within the optical conduit and surrounding the light source.

Sayers discloses an optical waveguide with "an input end for light input (Fig. 5, element 10), an output end for light output (Fig. 5, element 12); and a curved surface that totally and internally reflects light from the input end towards the output end (Fig. 5, elements 34 and 36); a light source embedded at the input end of the body, such that light is channeled from the input end through the body and emitted out the output end (Figs. 5 and7, element 18); and a reflector cup embedded at the input end of the body

and surrounding the light source (Fig. 11, element 70), the reflector cup configured to redirect light from the light source towards the output end of the body (col. 4, lines 26-28)".

At the time of invention it would have been obvious to one skilled in the art to modify the optical mouse of Sun using a culminating lamp of Sayers in place of the light source and light-emitting lens arrangement of Sun. The motivation for doing so would have been to utilize a single unit light pipe as shown by Sayers that can be modified to provide more direct light rather than diffuse light and to provide more light to the reflecting surface for operation of the optical mouse. Therefore, it would have been obvious to one skilled in the art to combine the teachings of Sun and Sayers to produce an optical mouse as described in claims 8 and 13.

Regarding claim 12, Sayers teaches the shape of the light pipe being a parabola (col. 3, lines 43-63).

Response to Arguments

5. Applicant's arguments with respect to claims 1, 3-8, 12, and 13 have been considered but are moot in view of the new ground(s) of rejection based only the newly cited prior art from the Applicant.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven E. Holton whose telephone number is (571) 272-7903. The examiner can normally be reached on M-F 8:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amr Awad can be reached on (571) 272-7764. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Steven E. Holton
Division 2629
February 6, 2007

AMR A. AWAD
SUPERVISORY PATENT EXAMINER